

PATENT SPECIFICATION

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(54) AN IMPROVED GEAR SYSTEM

(71) We, DAVID BROWN GEAR INDUSTRIES LIMITED of Park Gear Works, Huddersfield in the county of York, a British company, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to gearboxes, and more particularly to epicyclic reversing gearboxes.

According to the invention, a gearbox has two input shafts and a single output shaft and comprises two gear systems each of which is co-axially associated with one of the input shafts and includes two sunwheels secured to the associated input shaft, two sets of planet gears each meshing with one of said sunwheels, an annular gear meshing with one of said sets of planet gears, a planet carrier for the other of said sets of planet gears, brake means for alternatively holding said annular gear or said planet carrier against rotation, and a planet carrier for said one set of planet gears secured co-axially to an annular gear meshing with said other set of planet gears and to a pinion; and a common gear wheel meshing with both of the pinions and secured to the output shaft.

The invention will now be described, by way of example, with reference to the accompanying drawing which is a diagrammatic plan view of a gearbox for a ship.

Referring now to the drawing, a gearbox for a ship has two parallel input shafts 10 adapted to be driven by respective turbines 11, and a single output shaft 12 adapted to drive a propeller 13. Two identical gear systems are co-axially associated with the respective input shafts 10. Thus each of the input shafts 10 has two axially spaced sunwheels 14 and 15 secured to it, and the sunwheel 14 meshes with a set of simple planet gears 16 while the sunwheel 15 meshes with a set of simple planet gears 17. An annular gear 18 meshes with the set of

planet gears 16, and a planet carrier 19 is provided for the set of planet gears 17. The annular gear 18 and the planet carrier 19 are associated with respective brakes 20 and 21, the arrangement being such that both brakes 20 or both brakes 21 are applicable alternatively. A planet carrier 22 for the set of planet gears 16 is secured co-axially to an annular gear 23 meshing with the set of planet gears 17 and to a pinion 24. Said pinion is disposed on a sleeve 25 secured between the planet carrier 22 and the annular gear 23, and the sleeve 25 is mounted in bearings (not shown) disposed on both sides of the pinion 24. The two pinions 24, which are co-axial with the respective input shafts 10, both mesh with a common gear wheel 26 secured to the output shaft 12. Each of the input shafts 10 is provided with a brake 27 for its turbine 11. Each turbine 11 can be disposed at either end of the associated input shaft 10, and the brake 27 for each turbine 11 is conveniently disposed at the opposite end of the associated input shaft 10 to its turbine 11.

In operation, assuming that the two input shafts 10 both rotate in the same direction, the application of the two brakes 20 causes the output shaft 12 to rotate in one direction, and the application of the two brakes 21 causes the output shaft 12 to rotate in the other direction. Preferably, said one direction of rotation is arranged to result in ahead motion of the ship and said other direction of rotation is arranged to result in astern motion of the ship. This is because, when the planet carriers 19 are held against rotation, the sets of planet gears 16 rotate very rapidly about their axes, and it is preferred that this condition should only occur during the short, infrequent periods when astern motion is required.

WHAT WE CLAIM IS:—

1. A gearbox having two input shafts and a single output shaft and comprising two gear systems each of which is co-axially associated with one of the input shafts and

includes two sunwheels secured to the associated input shaft, two sets of planet gears each meshing with one of said sunwheels, an annular gear meshing with one of said sets of planet gears, a planet carrier for the other of said sets of planet gears, brake means for alternatively holding said annular gear or said planet carrier against rotation, and a planet carrier for said one set of planet gears secured co-axially to an annular gear meshing with said other set of planet gears and to a pinion; and a common gear wheel meshing with both of the pinions and secured to the output shaft.

2. A gearbox according to claim 1, wherein the two input shafts are adapted to be driven by respective prime movers and each of said shafts is provided with brake means for its prime mover.

3. An epicyclic reversing gearbox constructed, arranged and adapted to operate substantially as hereinbefore described with reference to, and as illustrated by, the accompanying drawing.

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COMPLETE SPECIFICATION

1 SHEET

*This drawing is a reproduction of
the Original on a reduced scale*

